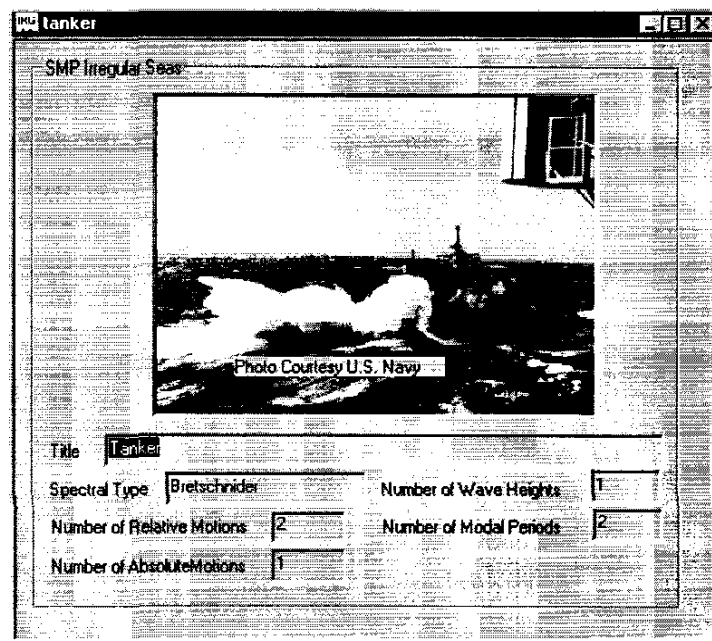


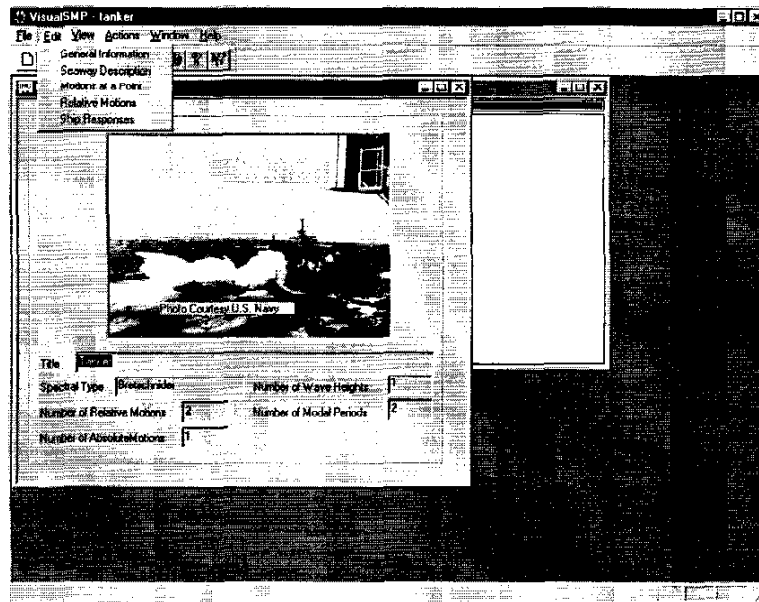
6 Monohull Irregular Waves

The monohull irregular wave module is run by either opening an existing irregular wave run file (*.irg) or creating a new irregular wave run file. If creating a new irregular wave run, the module assumes that the regular wave input file, <filename.inp>, is located in the current directory. The standard Windows File menu interface controls both actions.

The input to be developed for the monohull irregular wave module consists of seaway definitions and point locations for motion calculations. The actual input of this data into VisualSMP is accomplished via a series of Windows dialog forms, which are accessed via the Edit menu. The data record sets required for the Irregular Wave Module is described below. Units used for the monohull irregular wave input file must be consistent with those found in the regular wave file.



6.1 Edit

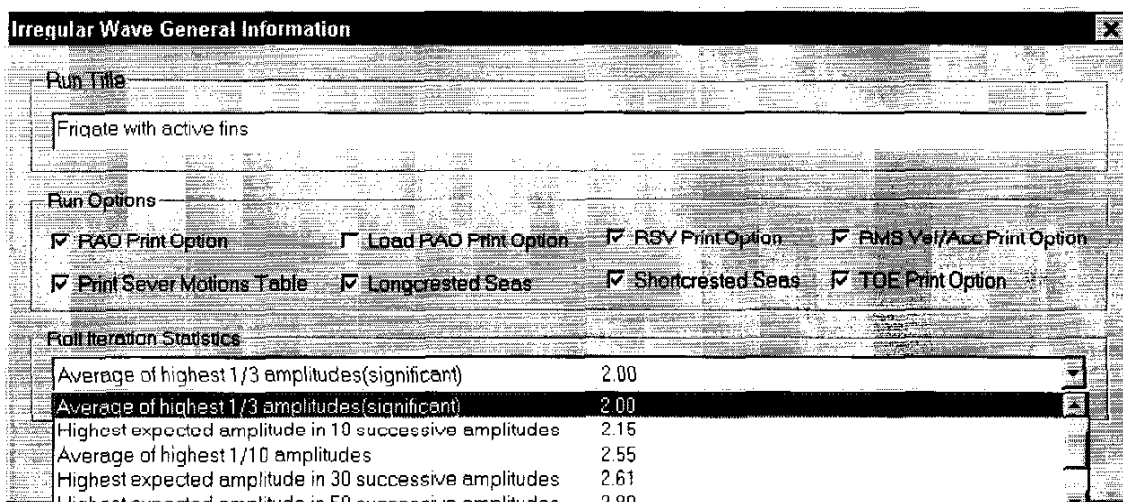


As with the Regular Waves module, data and information required for the analyses is entered through a series of dialog boxes accessed through the Edit menu.

Output files from the irregular wave run are:

- ◆ **filename.spl** - Speed Polar Plot files for rigid body motions.
- ◆ **filename.slm** - Speed Polar Plot files for relative motions.
- ◆ **filename.rpt** - RAO plot files.
- ◆ **filename.oof** - Irregular Wave Module output file.
- ◆ **filename.lgg** - Run history file.

6.1.1 General Information



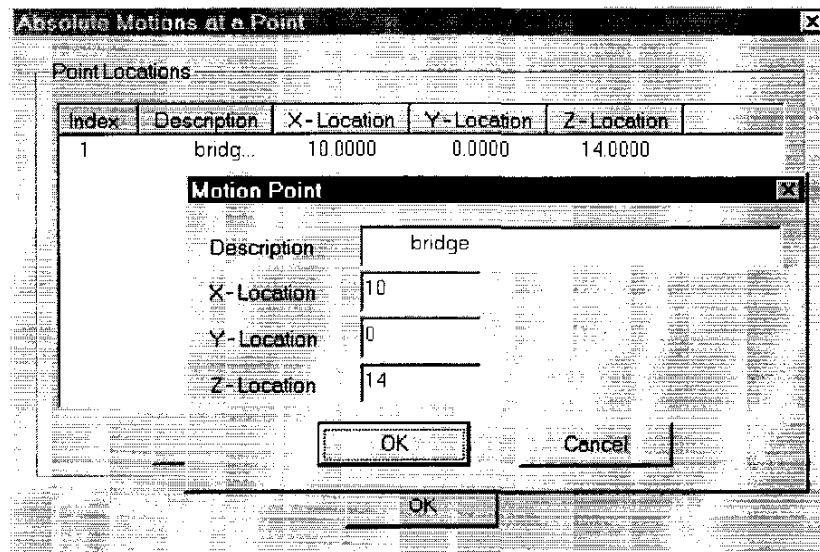
- ◆ RAO Print Option - Option to print ship response amplitude operators to a file.
- ◆ Load RAO Print Option - Option to print load response amplitude operators to a file.
- ◆ RSV Print Option - Option to print ship response statistical values to a file.
- ◆ RMS Vel/Acc Print Option - Option to print RMS velocities and accelerations to a file.
- ◆ Print Severe Motions Table - Option to print severe motion table to a file.
- ◆ Longcrested Seas - Option to select longcrested seas.
- ◆ Shortcrested Seas - Option to select shortcrested seas.
- ◆ TOE Print Option - Option to select encountered modal periods (TOE's) for all responses.

6.1.2 Seaway Description

6-3

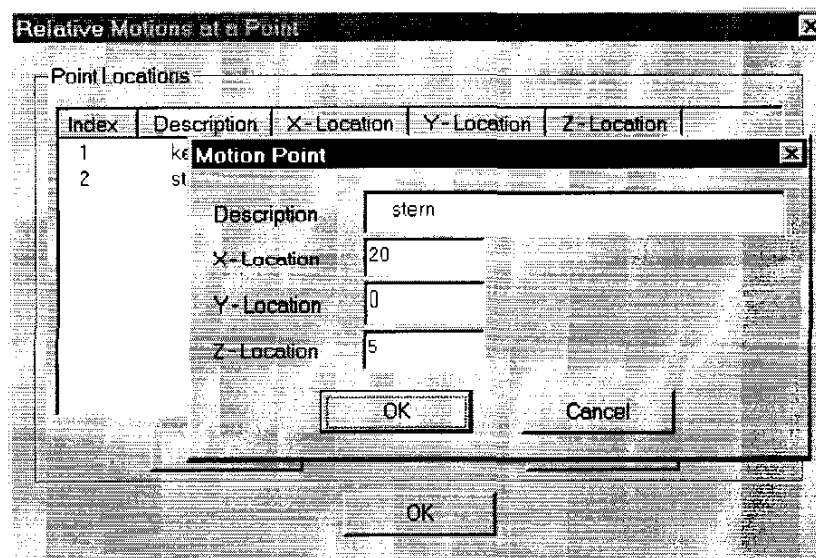
Seaway information is entered through a dialog box. VisualSMP supports Bretschneider, Jonswap, and Ochi-Hubble 6 Parameter waveforms. After selecting the type of seaway to be used for the analyses, wave heights and modal periods to be considered are entered using the 'Add' buttons. If applicable, Ochi-Hubble Spectrum Parameter inputs will be available for data entry.

6.1.3 Motions at a Point



Absolute motions at specific points can be calculated by VisualSMP. Points to be evaluated are entered by clicking the 'Add' button in the Absolute Motions at a Point dialog box. Data entered includes a description of the point, e.g. 'bridge' and the coordinates of the point. Y and Z coordinates are entered in terms of the length units set for the run, X coordinates are entered in terms of station number.

6.1.4 Relative Motions



VisualSMP also calculates motions for a point relative to the water surface. This capability is useful when checking a design for deck wetness or appendage emergence. Point information is entered in the same fashion as with absolute motions. Relative motions are affected by the wave profiles.

6.1.5 Ship Responses

Ship Responses

6 DOF Origin Motions

Displacement: Enable, Disable, Enable Toe's
 Velocity: Enable
 Acceleration: Enable

Responses for: Enable Toe's

Location	DSP	VEL	ACC	HFE	MS
1	1	1	1	1	

Location	DSP	VEL	SLM	EMG	W
1	1	1	1	1	
2	1	1	1	1	

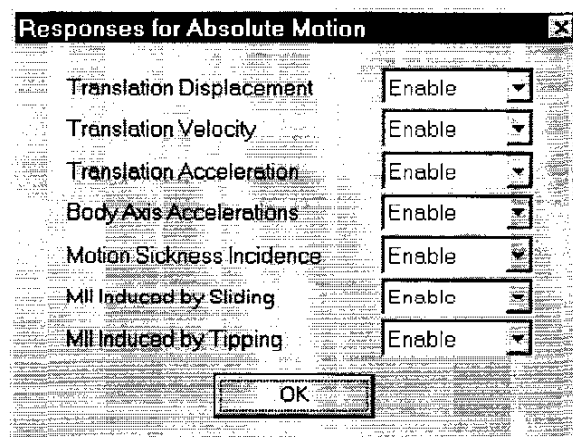
Load Responses

Torsional Moment: Disable
 Horizontal Bending Moment: Disable
 Vertical Bending Moment: Disable
 Vertical Shear Force: Disable
 Horizontal Shear Force: Disable

OK

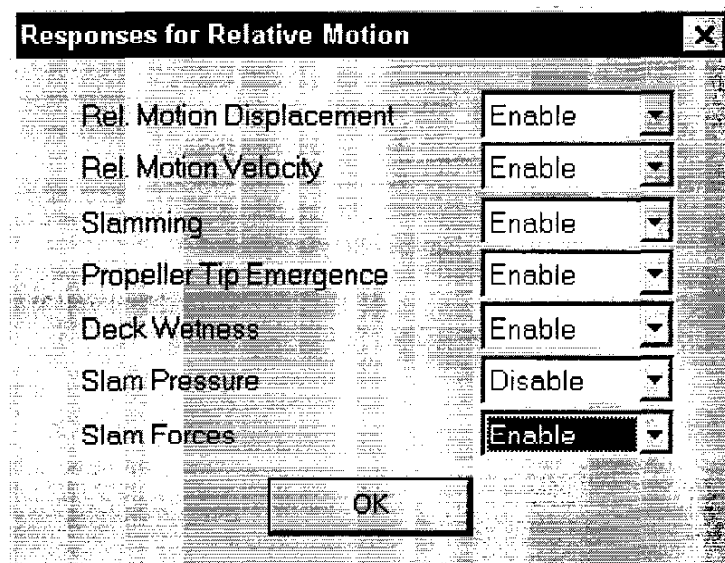
The Ship Responses dialog box allows the user to set which motions, load responses and other ship responses are to be determined during the analysis. For each of the six degrees of freedom (DOF), displacement, velocity and acceleration responses can be calculated. Torsional Bending, Horizontal Bending, Vertical Bending, Vertical Shear and Horizontal Shear loads on the hull may also be calculated. Selecting Disable, Enable or Enable Toe's from the drop down lists sets calculation of these responses.

6.1.5.1 Responses for Absolute Motion



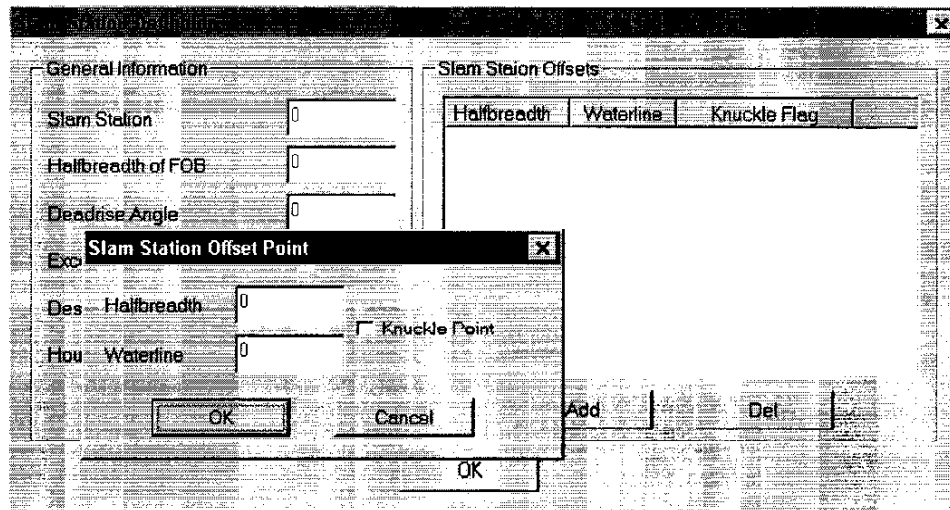
If the run includes absolute motions at a point, a listing of points being evaluated will be in the Ship Responses dialog box. Specific responses to be evaluated for a point are set by double clicking on the point index in the Ship Responses dialog box. Options to Enable, Enable Toe's or Disable will appear in the drop down lists as applicable. If Enable Toe's is set for Motion Induced Interruption (MI) Induced by Sliding or MI Induced by Tipping, a Slide and Tip dialog box will appear for entry of Object's CG and Object's Xmu.

6.1.5.2 Responses for Relative Motion



If the run includes relative motions, a listing of points being evaluated will be in the Ship Responses dialog box. Specific responses to be evaluated for a point are set by double clicking on the point index in the Ship Responses dialog box. Options to Enable, Enable Toe's or Disable will appear in the drop down lists as applicable.

6.1.5.2.1 Slam Station Definition



For Extreme Slam Pressure and Extreme Slam Forces, a Slam Station Definition dialog will be presented to the user. Variables to be entered are:

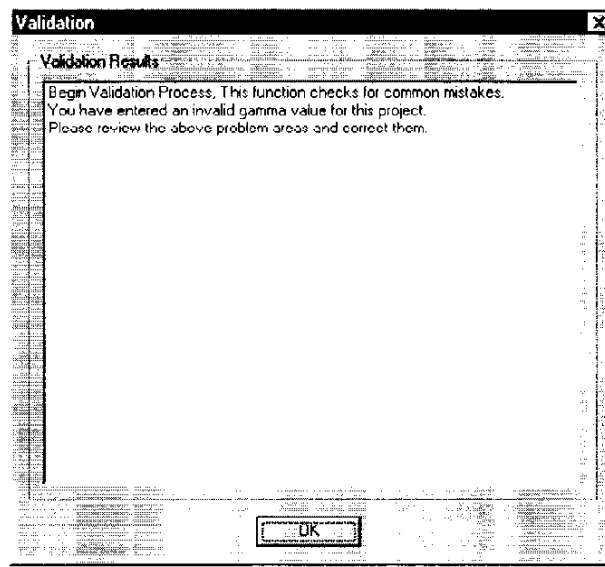
- ◆ Halfbreadth of FOB - half width of flat bottom at station.
- ◆ Deadrise Angle - deadrise angle in degrees at station. If the deadrise angle is less than or equal to zero, Ochi's method is used to compute form factor from a station description. The station description is from the keel to the deck edge and follows the rules of section definition in the regular wave module. If the deadrise angle is greater than zero, the truncated wedge method is used to compute form factor and no station needs to be defined.
- ◆ Exceedance parameter - exceedance parameter for calculation of extreme slamming pressure for design consideration. If the exceedance parameter is chosen to be 0.01, then it is possible to estimate the extreme value with 99 percent assurance. In other words, only one ship in 100 sister ships would suffer from a greater extreme pressure value.
- ◆ Design Draft - Design draft or draft at station.
- ◆ Hours of Operation - number of hours of ship operation time.
- ◆ Slam Station - the station being evaluated.
- ◆ Knuckles - a flag to indicate whether or not there are knuckles on the station.

6.2 View

The View menu provides standard Windows commands for hiding or displaying the Toolbar and Status Bar.

6.3 Actions

There are two available options under the Actions menu, Validate and Execute Irregular Waves. The Validate menu item will scan through the current data set and look for common problems, the results are displayed on the Validate Dialog. The Execute menu item runs the seakeeping analysis.



6.4 Window

The Window menu provides standard Windows commands for arranging the display window.

6.5 Help

The Help menu provides standard Windows commands for help and general program information.